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THE EFFECT OF AN IN-SERVICE LECTURE ON
DIABETES ON NURSES' ATTITUDES TO
DIABETES PATIENT EDUCATION

by

JENNIFER ANN WALTERS (RN; Dip. Health Sc., Nursing)

Submitted in partial fulfillment for the Degree of
Health Science, Nursing (Honours), School of Nursing,
Western Australian College of Advanced Education,
Churchlands Campus, Western Australia.

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ABSTRACT

Patient education has been shown to be a major factor in improving the compliance and self-care skills of diabetic patients, thereby improving the quality of life for the patient. Nurses have an important role in diabetes patient education. Research has indicated, however, that barriers such as lack of knowledge and negative attitudes may prevent nurses from effectively delivering this care to their patients.

The purpose of this experimental study was to determine whether increasing the knowledge of registered nurses through an in-service lecture on diabetes would improve their attitudes towards diabetes education. The conceptual framework for the study proposed that an increase in nurses' knowledge will lead to more positive attitudes toward, and consequently more practice of, patient education by nurses. This in turn will lead to an increase in the patient's self-caring abilities and ultimately an improvement in the quality of life for the patient.

Utilizing an experimental design, 34 nurses completed a Diabetes Attitude Scale pre- and post-test. The experimental group (n=17) attended an in-service lecture on diabetes, while the control group (n=16) did not. A two-factor repeated measures analysis of variance was used to make pre- and post-test comparisons between the groups. The post-test scores of the experimental group were found to be significantly higher than their own pre-test scores and the post-test scores of the control group.

These results emphasise the need to develop means of increasing the knowledge base of and developing more positive attitudes in registered nurses towards diabetes patient education.

I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education and that to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where due reference is made in the text.

Jennifer Ann Walters

15.11.89

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1. INTRODUCTION

Patient education has been shown to be an important component of the care of diabetic patients (Brown 1987; Anderson et al. 1988). Ongoing education is considered to be a major factor in reducing hospitalizations and decreasing the incidence of the long-term complications of the disease (McNeal et al. 1984; Gorman and Berrian 1987). This results in a decrease in costs, both in human terms for the patients themselves, and in economic costs to the community.

As the largest group of health care professionals, nurses have an important role in the ongoing education of the diabetic patient (Heller and Brown 1983). Studies have shown, however, that nurses are not performing this role effectively (Scheiderich et al. 1983; Weinzierl 1983). One barrier to effective diabetes patient education by nurses has been shown to be a lack of knowledge of diabetes (Scheiderich et al. 1983; Tilley et al. 1987). The attitudes held by nurses toward patient education have also been cited as a major influencing factor (Webb 1987). If a nurse does not have a sound knowledge of diabetes, and does not view patient education favourably, she/he is unlikely to provide effective education to diabetic patients.

This study will determine if increasing the nurse's knowledge of diabetes, through in-service education, will result in an increased positive attitude of the nurse towards diabetic education. The purpose of the study is to determine whether improving the knowledge base of registered nurses on diabetes will improve their attitudes toward diabetes education, as measured on a Diabetes

Attitude Scale (Appendix 1). It is postulated that if an increase in knowledge leads to an increase in positive attitudes toward patient education, this will have important implications for the patient, since patient education has been shown to increase compliance with diabetic regimes, resulting in an improved quality of life for the patient (Etzwiler 1967; McNeal et al. 1984).

2. LITERATURE REVIEW

2.1 Diabetes Mellitus

Diabetes mellitus is a disorder of carbohydrate, protein and fat metabolism, resulting from an imbalance between insulin availability and insulin need (Porth 1986, p.634). Approximately 20% of diabetics in Australia are Type 1, or insulin-dependent (IDDM) diabetics, with the remaining 80% being Type 2, or non-insulin-dependent (NIDDM) diabetics (Australian Diabetes Society 1988, p.6).

In Type 1 diabetes, there is an absolute insulin deficiency; the pancreas is unable to make insulin, or makes very little, producing a need for daily insulin injections (Porth 1986, p.632). This form of diabetes is more commonly diagnosed in childhood or adolescence. The main treatment for this group other than the insulin dose is correct diet and exercise (Diabetes Federation of Australia 1984, p.6). Type 2 diabetes usually develops in later years and is associated with a lack of insulin availability or effectiveness. This may be due to a number of factors, including inadequate amounts of insulin being produced in relation to need, and insulin being destroyed before it can exert its effect (Porth 1986, p.632). This form usually requires no insulin injections but can be controlled by diet and/or tablets which make the diabetic's own insulin supply more effective (Diabetes Federation of Australia 1984, p.7).

2.2 The Effects of Diabetes

Diabetes is one of the world's major public health problems, and is a serious health problem in Australia, affecting up to 500,000 people. The prevalence of diabetes in Australia has shown an increase of at least 50% over the last 15 years (Australian Diabetes Society 1988, p.7).

Diabetes is an important risk factor in heart disease and cerebrovascular accident, which are considered to be the first and third causes of death in Australia according to the Australian Bureau of Statistics, 1986 (in: Australian Diabetes Society 1988, p.8). Diabetes is also a leading cause of blindness, kidney failure and gangrene of the limbs (Australian Diabetes Society 1988, p.6).

The national economic cost of diabetes in Australia is estimated to be \$1300 million each year, of which \$650 million is spent on medical treatment (Australian Diabetes Society 1988, p.4). Patients with diabetes are hospitalized more often and have substantially increased duration of admission than non-diabetic patients. The chronic complications of diabetes cause significantly increased occupancy of nursing home and long-term hospital beds (Australian Diabetes Society 1988, p.11).

It is considered that research and education can assist in the control and prevention of diabetes, significantly reducing the social, medical and economic costs to the community (Australian Diabetes Society 1988, p.4)

2.3 The Importance of Diabetes Patient Education

The effective control of diabetes is primarily dependent upon patient adherence to regimes which are often complex, are of life-long duration and may require many behavioural changes on the part of the patient (Becker and Janz 1985). It is known that a substantial proportion of diabetic patients fail to comply with some or all aspects of their treatment regimes (Rosenstock 1985; Pendleton et al. 1987); studies suggest high rates of non-compliance in all age groups (Schatz 1988). In a study to determine some of the variables affecting compliance in a diabetic patient population, Schatz (1988) found that the patient's knowledge about the disease appeared to be one of the important factors involved in the control the patients chose to exert on their care.

Gorman and Berrian (1987) determined that only an informed and motivated person can carry out his/her own care effectively There is evidence, however, that the knowledge base of even long-term diabetics is inadequate for effective self-care (Beaser 1956; Etzwiler 1967; Collier and Etzwiler 1971; Germer et al. 1986; Brown 1987). Early studies by Beaser (1956), Etzwiler (1967) and Collier and Etzwiler (1971) found areas of knowledge deficiency of diabetics involving their understanding of diet, acidosis and alterations in management that occur with changes in activity or illness. A more recent study conducted by Germer et al. (1986) utilizing a questionnaire survey of IDDM patients at an outpatient clinic, revealed major limitations in their understanding of their disease. Knowledge deficits were found in most aspects of diabetic management, including simple metabolic details, use of insulin,

hypoglycaemic reactions, effects of exercise and illness, urine-testing and diet. A study by Brown (1987) investigated the adequacy of knowledge of self-management principles of IDDM patients. Despite the small sample size of her study (n=30), she found a similar pattern, with only 33.3% of participants achieving scores higher than that considered to be the minimum necessary for "adequate" knowledge.

Since the patient with diabetes mellitus must assume such a major role in the management of his/her disease and yet has been shown to be lacking in the necessary knowledge and skills, ongoing patient education is required in order to achieve optimal management (Etzwiler 1967; Brown 1987; Anderson et al. 1988). Patient education has been widely acknowledged as an essential part of the care of the person with diabetes (Graber et al. 1977; McNeal et al. 1984) and is considered to be a key component of treatment in the reduction of hospitalizations and the long-term complications of diabetes (McNeal et al. 1984; Gorman and Berrian 1987). Education has been shown to have positive effects on the patient's compliance, attitude, anxiety and adaptation to diabetes (Legge et al. 1980; Mazzuca et al. 1986). A study by Anderson et al. (1988) suggested that diabetes education can also assist the diabetic patient to adjust psychologically and socially to diabetes.

Education programmes should be tailored to the needs of the patient and the desired end-results. For example, Graber et. al. (1977) in a review of the effects of a number of diabetic education programmes, found that although the programmes significantly improved knowledge about diabetes, they failed to affect metabolic control.

Watts (1980) states that the value of diabetic education will be limited if it provides information with no other clinical value.

Scott et al. (1984) researched the effectiveness of an education programme for NIDDM patients and found improvements in the control of blood glucose levels in the group which had attended the programme. These improvements, however, were not sustained. Berger (1984) evaluated the effectiveness of diabetes education as a means of improving the quality of diabetes care. The goals of diabetes therapy were seen as attaining optimal metabolic control, the prevention of both acute and chronic complications, and achieving an improvement in the quality of life for the patient at an acceptable cost. Berger reported a significant improvement in the blood glucose levels of the participants for at least 22 months, as well as a significant reduction in the hospital admissions of conventionally treated IDDM patients.

In a recent study conducted by Yuen and McCann (1989) at a major teaching hospital in Western Australia, 105 selected diabetic patients (mostly NIDDM) attended a diabetes group education programme designed to promote self-care. At the end of the programme there was a significant increase in the knowledge of the participants and in their blood sugar control. These improvements were found to be sustained on re-assessment twelve weeks later, suggesting that diabetics who knew more about their condition were able to achieve better overall blood glucose control. The same study determined, however, that for practical skills such as blood glucose measuring, a one-to-one teaching situation might be more effective.

2.4 The Nurse's Role in Patient Education

The role of the nurse in patient education has an historical background dating back to Florence Nightingale (Novak 1988). Patient education as an important function in nursing practice is well recognised in both the research literature (Cross and Parsons 1971; Stanton 1986) and the non-research literature (Cohen 1981; Pavlish 1987; Close 1988). A review on patient education by Close (1988) concluded that teaching patients is an essential part of nursing care, suggesting that the nurse has more opportunity for patient education than any other member of the health care team since she spends more time with the patient, and is in a position to be able to assess his education needs and his readiness to learn.

Caffarella (1984) looked at how nurses and other health professionals define the nurse's role in patient education. Although she found that nurses ascribed a greater role for themselves in planning and executing patient education programmes, a majority of the other health professionals (69%) felt that nurses should have primary responsibility for conducting patient education.

In America, this role is a legal, as well as moral and professional responsibility. The American Hospital Association's Patients Bill of Rights mandates patient education as a right of all patients (Phillips and Hekelman 1983, p.42), and the nurse practice acts in many states include health education as a responsibility within the scope of professional nursing practice (Close 1988, p.204; Honan et al.1988, p.33).

2.5 Factors Influencing the Nurse's Role in Patient Education

If the nursing profession is to be responsible for patient education, it is necessary to determine the factors that will affect the nurse's ability to function in this role (Honan et al. 1988). The obstacles interfering with the teaching role of the nurse must be identified and overcome if nursing is to contribute significantly to quality health care (Winslow 1976).

The literature suggests that nurses are not clear about their role in patient education (Cohen 1981; Tilley et al. 1987). Honan et al. (1988) conducted a study to describe registered nurses perceptions of their responsibilities in patient education and to determine factors affecting the nurse in fulfilling her/his role as patient educator. Results indicated that the nurse's perceived responsibility for patient education, the priority she/he placed on her/his role as health educator, and the level of knowledge of the nurse were all factors influencing her/his role in patient education.

Research into the nurse's role in diabetic education supports these findings. A study by Weinzierl (1983) indicated that two major reasons why nurses were hesitant to participate in diabetic education were that they lacked clear expectations of their role in diabetes education and that they felt uncomfortable about their knowledge in diabetes and their consequent ability to teach patients. The lack of knowledge in nurses has been cited as a major factor in many studies (Tilley et al. 1987; Honan et al. 1988). Etzwiler (1967), in evaluating the knowledge of diabetes among nurses and dietitians,

concluded that their knowledge was insufficient for diabetic teaching. Feustal (1976) repeated this study with senior nursing students, and found that even graduating students who were considered to be at the peak of their knowledge, were not well prepared to conduct diabetes education. In a more recent study which tested the diabetes knowledge of practicing registered nurses, Scheiderich et al. (1983) also found their level of knowledge to be insufficient to teach diabetic patients.

2.6 The Role of Attitudes

Webb (1987) states that in order to provide their patients with the information they need, nurses not only need to be knowledgeable, but also need to have attitudes which are conducive to providing patient education. It is suggested that since attitudes influence behaviour, the development of positive attitudes will enhance nursing care (Hauck 1986).

Stanton (1986) suggested that nurses' attitudes toward educating the patient about his/her disease, treatment and self-care will strongly affect the patient's ultimate recovery. She conducted a study to develop a database with regard to nurses' attitudes towards patient education as an initial step in the evaluation of teaching's real impact on patient outcomes. Results indicated that although nurses perceived patient education as an important component of their role as a nurse, they still had some confusion over this role.

2.7 The Relationship Between Knowledge and Attitudes

Close (1988) suggested that a positive attitude is essential towards patient education, but that without knowledge, the nurse cannot be motivated to teach patients. Although much of the literature does not specifically focus upon diabetes education, there have been numerous studies that have looked at the relationship between the knowledge base of nurses and their attitudes towards patient care. These have demonstrated that an increase in the knowledge base of nurses is associated with the development of more positive attitudes towards patient care in gerontological nursing (Harrison and Novak 1988); cancer pain management (Myers 1985; Hauck 1986); the care of AIDS patients (Wertz et al. 1987; Turner et al. 1988) and nutrition education (Ross 1984).

Much of the research that has been conducted in diabetes with regard to attitudes has focused on the attitudes of diabetic patients (Anderson et al. 1988; Anderson et al. 1989). In one of the few studies conducted on the attitudes of health professionals towards diabetes and its treatment, Weinberger et al. (1984) found that the attitudes of physicians were important predictors of the amount of metabolic control achieved by their diabetic patients. The little research that has looked at the attitudes of nurses towards diabetes education, suggests that when nurses increase their knowledge of diabetes through attendance at continuing education courses, there is often a concurrent improvement in their attitudes toward diabetic patient education (Warren-Boulton et al. 1982; Martin et al. 1986). These studies suggest that an increase in the knowledge of nurses about diabetes will positively influence their professional behaviour,

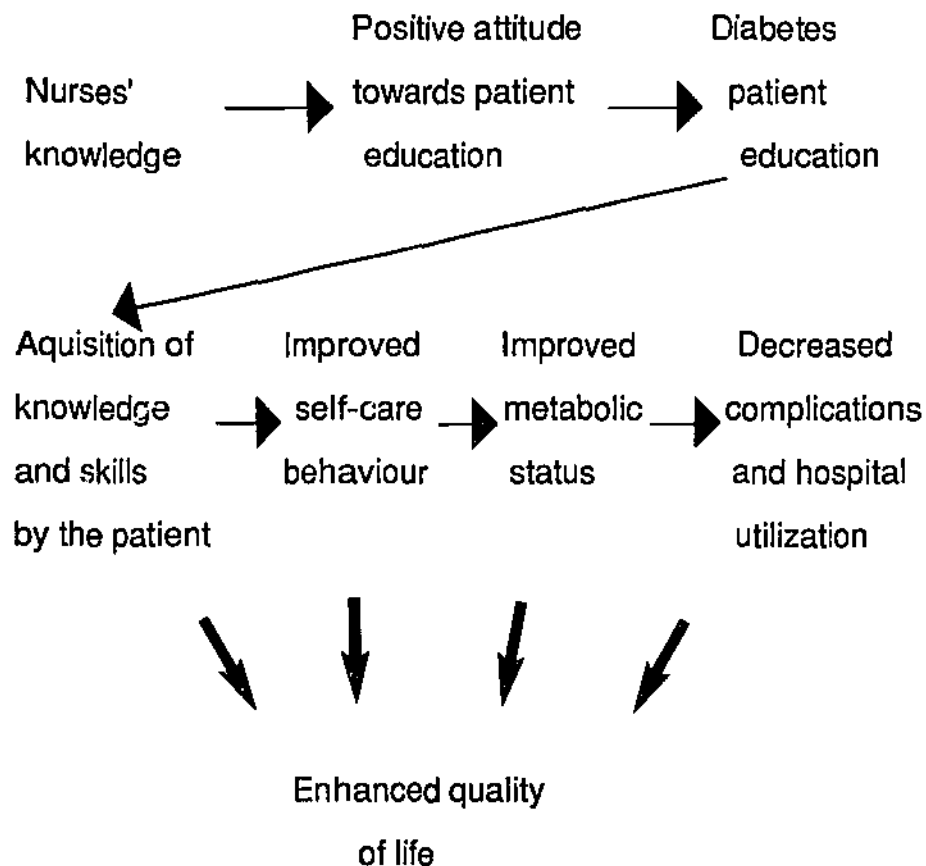
improve their skills and create more positive attitudes towards diabetes education, thereby improving the care given to patients.

Since patient education has been shown to be such a major component of the treatment of the diabetic patient, it is important that further research is carried out in this area so that specific data can be collected on the role of nurses' attitudes in patient teaching. Controlled studies are required to determine the influence that continuing education programmes have on improving nurses' knowledge, and whether this will lead to a subsequent improvement in their attitudes towards diabetic patient education.

3. CONCEPTUAL FRAMEWORK

3.1 The Relationship between Knowledge and Attitudes

The conceptual framework in this study is the relationships between nurses' knowledge and attitudes to patient education, and the patient's ability to perform self-care. It is postulated that an increase in nurses' knowledge will lead to a more positive attitude towards patient education. Ongoing patient education has been shown to lead to an increase in the patient's self-caring abilities, ultimately resulting in an increase in the quality of life for the patient (McNeal et al. 1984; Mazzuca et al. 1986; Brown 1987). The following model has been developed from Anderson et al. (1988, p.298).



3.2 Objectives

The objectives for this study have been formulated as specific hypotheses to be tested as follows.

1. The mean score on a diabetes attitude scale of nurses who will attend an in-service course on diabetes will not differ from the mean score of nurses who will not attend the course, prior to the course being conducted.
2. The mean score on a diabetes attitude scale of nurses who have attended an in-service course on diabetes will be greater than the mean score of nurses who did not attend the course.
3. The mean score on a diabetes attitude scale of nurses who have attended an in-service course on diabetes will be greater than their mean score prior to attending the course.
4. The mean score on a diabetes attitude scale of nurses who did not attend an in-service course on diabetes will not alter when re-tested.

3.3 Operational Definitions

For the purpose of this study, the following definitions have been determined:

Diabetes mellitus

"... a chronic, hereditary disease characterised by an abnormally high level of glucose in the blood and the excretion of that sugar in the urine. The basic defect is an absolute or relative lack of insulin which leads to abnormalities of metabolism, not only of carbohydrate but also of protein and fat" (Feustal 1976, p.5).

Diabetic patient

Any patient with a medical diagnosis of diabetes, including both insulin-dependent diabetes and non-insulin-dependent diabetes.

Patient education

"... a two-way process of planned, intentional and systematic teaching by the nurse and learning by the patient, with the purpose of achieving a specific goal, that is, optimum health" (Close 1988, p.203-4).

Attitude

The score achieved by a nurse on the Diabetes Attitude Scale developed by Anderson et al. (1989) (Appendix 1).

Nurses

All nurses registered with the Nurses' Board of Western Australia, who were employed at the study hospital, full- and part-time on all shifts, in clinical nursing practice with patient contact, excluding those working in the operating theatres.

In-service course

A lecture on diabetes (Appendix 2) of approximately one hour in

duration, which was conducted by the Diabetes Nurse Educator at the study hospital.

3.4 Identification of Major Variables

Independent variable: an in-service lecture on diabetes education conducted by the Diabetes Nurse Educator at the study hospital, as outlined above.

Dependent variable: the attitudes of registered nurses to diabetes patient education, as measured by their scores on the Diabetes Attitude Scale developed by Anderson et al. (1989) (Appendix 1).

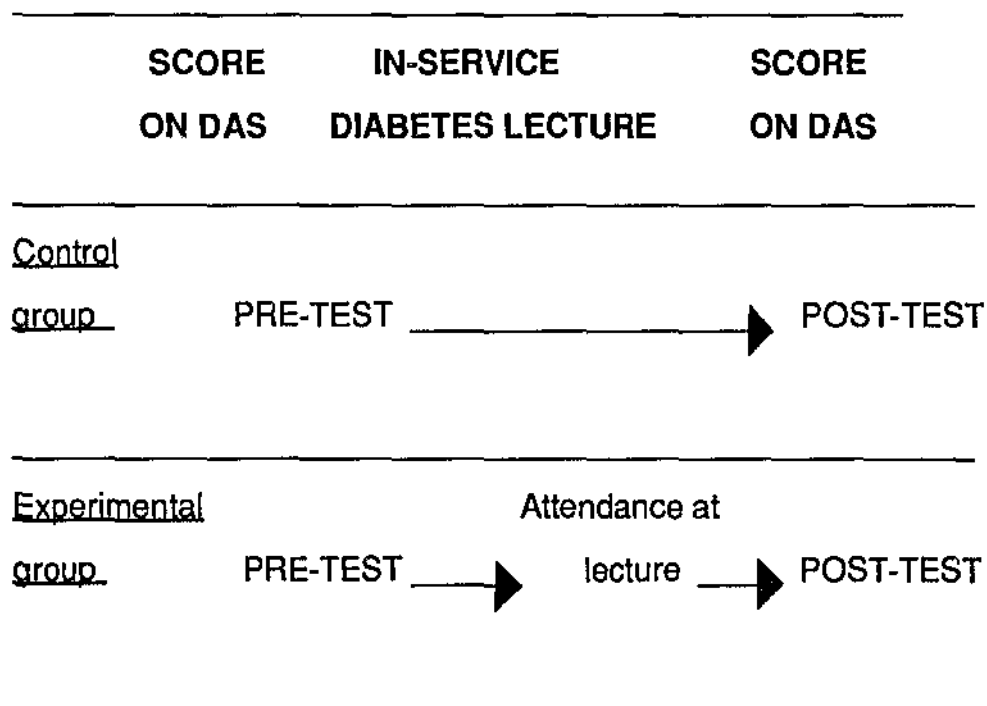
Extraneous variable: the years of post-registration nursing experience of the nurses taking part in the study.

4. METHODS AND PROCEDURES

4.1 Design

This study utilized a pre-test/post-test experimental design (Table 1). The Diabetes Attitude Scale (DAS) (Appendix 1) developed by Anderson et al. (1989) was used before and after attendance of nurses at an in-service course on diabetes education. The DAS was developed to provide a measure of the attitudes of health professionals towards diabetes education; an intended use of the scale was in the evaluation of the effectiveness of a professional diabetes education programme (see 4.5). Of nurses who consented to participate in the study, half attended the in-service course, while the other half operated as a control group and did not attend the course.

Table 1: PRE-TEST/POST-TEST EXPERIMENTAL DESIGN UTILIZED IN THIS STUDY



4.2 Population and Sample

In this study the complete population of registered nurses permanently employed in the clinical areas of the study hospital (N=67) was used, excluding those employed in the operating theatres. The latter were not included since it was considered that the opportunities for diabetic patient education in theatre were limited. Only those nurses who had direct patient contact were included. The entire population was used because of the small size of the population.

Only those who completed both pre- and post-test questionnaires and who attended the in-service lecture if in the experimental group, were included in the final analysis of results (N=34). This provided a final response rate of 50.74%.

Participants were aged between 22 and 50 years and had between 0 and 30 years of post-registration nursing experience. All but three of the participants were female. Confidentiality is considered under Ethical Considerations (see 4.4).

4.3 Setting

The study was conducted at a Western Australian Government, community-based, acute-care hospital. The hospital contains 89 beds, including medical, surgical, paediatric, maternity, and accident and emergency. The study was conducted in all clinical areas of the hospital, excluding operating theatres.

4.4 Ethical Considerations

Consent for this study was sought and obtained from the Ethics Committee at the Western Australian College of Advanced Education, Churchlands campus, and from the Director of Nursing and the Ethics Committee at the study hospital (Appendix 3).

Participation in the study was entirely voluntary, and a consent form was attached to each questionnaire (Appendix 4). A box was provided for consent forms to be returned separately. An explanation of the study purpose and assurance of confidentiality were included. Participants were informed that there was no compulsion to participate and that they were free to withdraw at any time (Appendix 4).

Although number identification on the questionnaires was used to allow comparison of scores, participants were not identified by name. Responses were confidential, and sealable envelopes were provided for the return of questionnaires. Completed questionnaires were seen only by this researcher, used for the purpose of this study only and were destroyed at the end of the study.

The in-service programme was repeated at the end of the study for those nurses in the control group who wished to attend. Although enrolled nurses were not included in the study, they were all welcome at any of the lectures.

It is intended to provide an in-service lecture explaining the study in more detail, and summarizing the results and implications of the

results, at the end of the study. This will provide feedback to the participants on their own roles in the study, and on how the results will effect their own nursing practice.

4.5 Data Collection

Half of the population was randomly selected to attend the in-service lecture, while the other half operated as a control group and did not attend. Random sampling was achieved by placing each individual's name on a slip of paper and placing the names in a box. Each name pulled out of the box was placed in the experimental group (N=34). The slips were replaced each time to maintain equal probability of selection.

Instructions for participation and an explanation of the study were posted in each ward (Appendix 5). The questionnaires were placed alphabetically in boxes on each ward and enclosed in envelopes with each person's name attached to the envelope by a detachable sticker. Participants were requested to remove and discard the name sticker, tear off the signed consent form and place it in an envelope provided (attached to the box) and place completed questionnaires back into the sealable envelopes, returning them to the same box within two weeks. Reminder notices were posted in the wards after one week to enhance compliance. The completed questionnaires were then collected before the lecture was conducted. This procedure was repeated following the lecture, but including only those nurses who had signed consent forms, completed the first questionnaire and attended the lecture if in the experimental group. A list of all nurses who attended the lecture was made to ensure that all experimental

group participants and none of the control group participants attended.

A number code was used on the questionnaires to allow identification for comparison of scores, while maintaining confidentiality. This also allowed identification of participants who withdrew from the study; only those who filled out both questionnaires were included in the data analysis. The number code was also written on the consent form to ensure that only those who gave written consent were included in the data analysis.

The questionnaire used in this study was the DAS developed by Anderson et al. (1989). This scale was developed in response to the United States National Diabetes Commission's 1975 report suggesting that the diabetes-related attitudes of health professionals were often inappropriate and could be detrimental to the diabetic patient (Anderson et al. 1989, p.120). Anderson and his colleagues attempted to develop an instrument which would provide "a valid and reliable general measure of health care professionals' attitudes towards diabetes" (Anderson et al. 1989, p.121). It was intended that the DAS would be used to evaluate the effectiveness of diabetes educational programmes in creating more positive attitudes in health professionals towards diabetes patient education.

4.5.1 Reliability

Reliability of the DAS was not tested prior to the study due to time constraints, and the study was conducted as a pilot for further

research in this area. Statistical analysis of the pre-test scores of both control and experimental groups, however, resulted in a Cronbach's alpha score of 0.84. This compares favourably with the original score in the study by Anderson et. al. of 0.83.

4.5.2 Validity

Validity was tested by having the DAS assessed by a team of six diabetes education experts in Western Australia. All were practicing registered nurses with at least 12 months recent experience in diabetes education and all had a post-basic qualification in diabetes education. The questionnaires were sent out to these diabetes educators with a covering letter of explanation (Appendix 6), a marking guide (Appendix 7) and a stamped-addressed envelope for return of the marking guides. Any questions which were rejected by two or more of the diabetes educators were discarded from the questionnaire, since time constraints did not allow for re-assessments. Out of 31 questions, 6 were discarded, leaving 25 questions for the study.

4.6 Limitations of the Study

The following limitations to this study have been identified:

- 1) A potential bias could have existed in that the investigator was known to the subjects of the study as an employee in the hospital. This may have affected responses to the DAS. For example, nurses may have tried to interpret what response was desired by the investigator, rather than giving their own responses (social

desirability). To reduce the effects of this bias, all questionnaires were distributed and collected via boxes placed in working areas to limit the contact between the investigator and the participants. The investigator had no direct input with the in-service lectures.

2) Nurses who attended the in-service course could have conferred with nurses who did not attend, influencing the responses of the control group. This potential bias was limited by strongly urging participants not to confer with each other during the study. The importance of this was clearly stated in the instructions, to enhance compliance with the above request (Appendix 5).

3) Because the study was conducted as a pilot study at one hospital only, the results may not be applicable to other hospitals. It is suggested, however, that further research in this area might include a similar study at a number of hospitals of similar size and function (see 6.4).

5. RESULTS

5.1 Data Analysis

This study measured the effect of an in-service lecture on diabetes on the attitudes of registered nurses toward diabetes patient education, using a pre- and post-test design. The DAS, formulated by Anderson et al. (1989), was used to measure these attitudes. The original 31-item DAS was modified following validity testing, leaving 25 items to be measured on a 5-point scale (1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4= agree, 5= strongly agree). Items reflecting negative attitudes were scored with an appropriate scale conversion.

All statistical analyses were carried out using the Apple MacIntosh STATVIEW package, version 512+). Descriptive statistics were used to describe the frequency distribution of scores. To analyse the four specific hypotheses regarding differences between mean scores (see 3.2), a two-factor repeated measures analysis of variance (ANOVA) was used, since it is not valid to use a series of 2-sample tests to examine a multisample hypothesis (Zar 1974, p.130).

The non-repeated measurement factor in this study was whether the individual was in the control or experimental group, and the repeated measurement factor was pre- and post-test scores on the DAS. Ferguson (1981, pp 328) gives the expected mean squares to calculate the significance of group, repeated measures and interaction effects. Following analysis of variance, multiple comparisons were made between all mean scores using the

Student-Newman-Keuls (SNK) test. The repeated measure-by-individuals within groups mean square was used as an error variance (Ferguson 1981, pp 328). The effect of the years of experience of the participants in the study on their scores was examined using the Pearson's product-moment correlation.

5.2 Results of Study

The mean pre-test scores of the control and experimental groups on the DAS did not differ significantly (Mann-Whitney-U test: $U=184.5$, $P>0.20$). The pre-test scores were therefore pooled to examine the frequency distribution, which was found to be non-normal (Fig. 1).

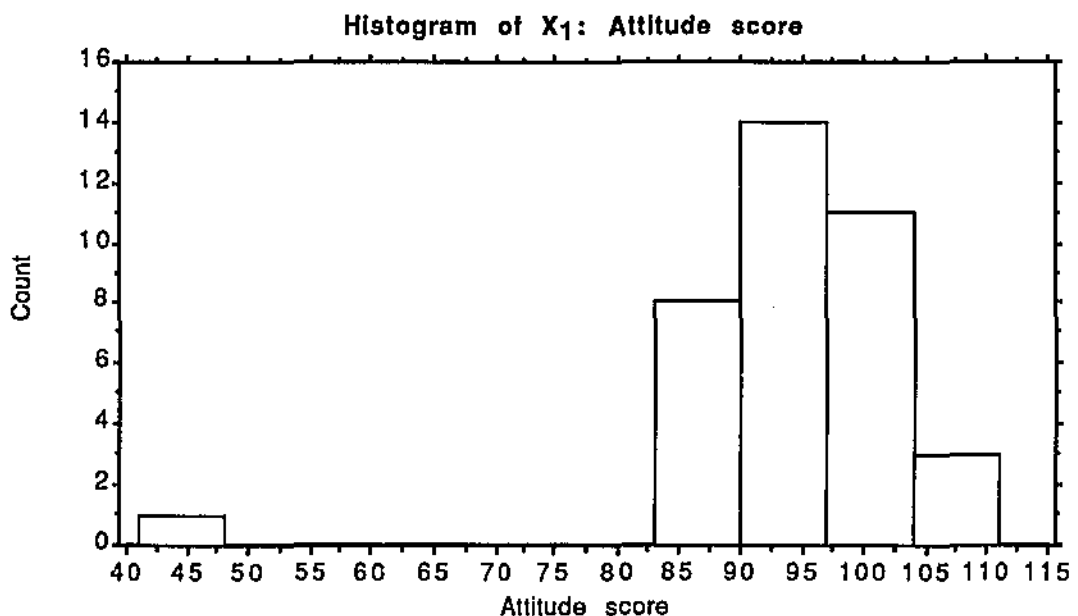


Figure 1: Frequency distribution of pre-test attitude scores of pooled control and experimental groups

The distribution was significantly negatively skewed and leptokurtic ($g_1 = -2.90$, $g_2 = 12.67$, $P < 0.01$). Upon examination, the distribution was found to be influenced by the outlying score of one individual,

the removal of which normalized the distribution ($g_1 = 0.46$, $g_2 = -0.64$, $P > 0.20$). The scores of this individual were disregarded in subsequent analyses. No significant relationship was found between years of experience and scores on the DAS in the pre-test sample ($r = 0.08$, $P > 0.50$).

Table 1 shows the means of the pre- and post-test scores of both control and experimental groups. These results indicate that the mean score of the experimental group increased following attendance at the in-service lecture. The mean score of the control group upon re-testing did not increase.

Table 1: Mean pre- and post-test scores of control and experimental groups

	CONTROL		EXPERIMENTAL	
	Pre-test	Post-test	Pre-test	Post-test
Mean	95.00	93.31	95.59	98.53
Std. Error	1.91	1.78	1.39	2.06
N	16	16	17	17

This was confirmed by repeated measures ANOVA, which found that there was a significant interaction between groups and repeated measurements. This indicates that a change in score on the attitude scale, measured at different times, depended on whether an individual was in the control or experimental group. The SNK test showed significant differences in the mean attitude score of the

experimental group over repeated measurements ($q = 3.22$, $P < 0.05$) and in the mean attitude score of the control and experimental groups after retesting ($q = 5.63$, $P < 0.001$). There were no significant differences, however, in the mean attitude score of the control group over repeated measurements ($q = 1.80$, $P > 0.20$), or in the mean attitude score of the control and experimental groups on the first test ($q = 0.64$, $P > 0.50$).

Table 2: Effect of group and time measurement on attitude scores:
2-factor repeated measures ANOVA

Source of variation	d.f.	sum of squares	mean square	F	P
Group	1	138.88	138.88	1.50	>0.20
Individuals within groups	31	2876.60	92.79		
Repeated measure	1	8.02	8.02	0.57	>0.20
Group X repeated measure	1	88.30	88.30	6.23	<0.05
Repeated measure X individuals within groups	31	439.19	14.17		

These results are consistent with the hypotheses originally proposed. The mean scores of the control group did not differ significantly pre- and post-test, nor did the mean scores of the control and experimental groups differ significantly pre-test. The mean post-test score of the experimental group however, was significantly greater than both its pre-test score and the post-test score of the control group.

6. DISCUSSION

6.1 Major Findings

The results of this study demonstrated that an in-service lecture on diabetes mellitus produced a significant improvement in the attitudes of registered nurses toward diabetes patient education. Following an extensive search of the literature, to my knowledge this is the first evidence of the importance of education programmes in improving nurses' attitudes in this area of health care. Most previous studies have examined the attitudes of diabetic patients, rather than health professionals (Anderson et al. 1988).

These findings are consistent with those of similar studies in other areas of nursing care. Myers (1985) and Hauck (1986) found both an immediate and a sustained improvement in the knowledge and attitudes of nurses following education programmes on cancer pain management, and suggested that the results supported the need for more and improved education programmes for nurses. In an evaluation of the effectiveness of a gerontological continuing education programme on nurses' knowledge of and attitudes towards the elderly, Harrison and Novak (1988), found a small, but significant improvement in both the knowledge and attitudes of the participants after attendance at the course. Other researchers have stressed the important role that the attitudes of nurses and other health professionals might play in providing an increased quality of care, including education, for patients (Webb 1988; Stanford 1988; Anderson et al. 1989).

6.2 Conclusions

These results support the proposal that increasing the knowledge of nurses through continuing education programmes may have a beneficial effect in creating more positive attitudes towards patient education. If nurses have more positive attitudes toward patient education, combined with a sound knowledge base, they should be able to provide an improved standard of nursing care, resulting in an improved quality of life for the patient.

6.3 Implications for Nursing

This study focused on the role of non-specialized, hospital-based registered nurses in diabetic patient education. Although the initial education of the diabetic patient is usually undertaken by a team of diabetes experts, subsequent hospitalizations can be used as opportunities for review of diabetic education (Garber 1977); this role can be undertaken by non-specialized nurses (Cross and Parsons 1971; Scheiderich et al. 1983). In a survey of diabetes education programmes in Ohio hospitals, Essig and Thielen (1982) found that diabetes education was usually conducted by registered nurses and dietitians.

Several early studies demonstrated that diabetics were deficient in knowledge of their disease (Beaser 1956; Etzwiler 1967; Collier and Etzwiler 1971), yet long-term diabetics may still be overlooked as candidates for diabetic education (Tribble and Hollenberg 1977). It has been shown that patient education for diabetics needs to be ongoing (Myers 1977; Brown 1987; Anderson et al 1988) and that the

learning needs of the diabetic should be assessed whenever the diabetic is hospitalized (Tribble and Hollenberg 1977; Brown 1987). Williams et al. (1967) in a longitudinal study, suggested that continued support for the patient may be as important as the initial education. The results of more recent research by Anderson et al. (1988) suggest that the short-term gains resulting from intensive patient education can diminish over time, and that patient education should therefore be an ongoing process.

The findings of this and other similar studies suggest that there is a need for continuing education/in-service programmes for nurses in order to improve their knowledge base and their teaching skills. The subsequent improvement in the nurses' attitudes towards patient education should be followed by an improved quality of the teaching provided to the diabetic patient by the nurse. In order for nurses to become effective educators of diabetic patients, they must be sufficiently knowledgeable about the disease and its management and must have positive attitudes towards diabetes education.

Although there appears to be general agreement that a Diabetes Nurse Educator should be responsible for all diabetes teaching (Garber 1977; Tribble and Hollenberg 1977; Lipman 1986), the realities of economic and staffing constraints do not always allow for the ideal. The Diabetes Nurse Educator, therefore, needs to be responsible not just for initial education of diabetic patients but for education of the registered nurses who will have most continued contact with the patient (Garber 1977; Lipman 1986).

6.4 Recommendations for Further Research

This study has provided the first evidence that an in-service programme will significantly improve the attitudes of registered nurses towards diabetic education. Only one hospital was used in the study, however, and before the results can be generalized, the study should be repeated in a number of similar hospitals.

To provide more support for the conceptual framework used in the study, a valid and reliable tool should be developed to measure the knowledge of nurses before and after attendance at a diabetes education course. This would determine the effectiveness of the education course in increasing the knowledge of nurses, and would allow analysis of any significant correlation between knowledge and attitude scores. Post-testing of nurses should include an immediate post-test and longitudinal testing to determine whether improvements in knowledge and attitude are sustained.

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APPENDIX 1: DIABETES ATTITUDE SCALE (Anderson et al. 1989,
p.125)

Please circle the number which best represents your response to the statement. Please answer all questions.

1 = strongly disagree

2 = disagree

3 = neither agree nor disagree

4 = agree

5 = strongly agree

- | | |
|---|-----------|
| 1. It is important for diabetes educators to learn counselling skills | 1 2 3 4 5 |
| 2. Health care professionals who treat people with diabetes need training in communication skills | 1 2 3 4 5 |
| 3. To be effective, diabetes educators must master a substantial body of knowledge on teaching and learning | 1 2 3 4 5 |
| 4. Continuing education about diabetes should be mandatory for primary health care providers because of the rapid advances occurring in the field | 1 2 3 4 5 |
| 5. Specialized diabetes training for allied health care professionals results in better care for patients | 1 2 3 4 5 |

6. It is necessary to have special training to provide effective primary treatment of diabetes 1 2 3 4 5
7. Diabetes professional education should cover diabetes in the elderly 1 2 3 4 5
8. People with diabetes who maintain poor glucose control are more likely to have complications than people who maintain tight glucose control 1 2 3 4 5
9. There is a relationship between chronic high blood glucose and the onset of long-term diabetes complications 1 2 3 4 5
10. People with diabetes should choose their own goals for diabetes treatment 1 2 3 4 5
11. People with diabetes have the right to decide how aggressively they will work to control their blood glucose 1 2 3 4 5
12. The important decisions regarding daily diabetes care should be made by the individuals with diabetes 1 2 3 4 5
13. Individuals with diabetes should be taught to choose their own management options (e.g. type of meal planning, type of glucose monitoring, type of insulin regimen) 1 2 3 4 5

14. To provide sufficient self-care information to people with diabetes, physicians need the assistance of other health care professionals 1 2 3 4 5
15. Physicians should employ the expertise of a dietitian in treating people with diabetes 1 2 3 4 5
16. Physicians should employ the expertise of a nurse educator in treating people with diabetes 1 2 3 4 5
17. The primary care of diabetes does not require a diabetes care team 1 2 3 4 5
18. Diabetes that can be controlled by diet is a relatively mild disease 1 2 3 4 5
19. Non-insulin-dependent diabetes is a less serious disease than insulin-dependent-diabetes 1 2 3 4 5
20. Diabetes that is controlled by diet will not result in many long-term complications 1 2 3 4 5
21. It is difficult for health care professionals to influence the self-care behaviour of people with diabetes 1 2 3 4 5
22. It is frustrating to treat diabetes 1 2 3 4 5

23. People with diabetes are not as compliant with their treatment recommendations as they should be 1 2 3 4 5
24. People diagnosed with insulin-dependent-diabetes should be hospitalised at the time of diagnosis to facilitate effective patient teaching 1 2 3 4 5
25. Diabetes patient education is most effective when done in an outpatient setting 1 2 3 4 5

**APPENDIX 2: MAJOR POINTS DISCUSSED IN THE IN-SERVICE
LECTURE ON DIABETES MELLITUS**

1. Blood glucose monitoring: a practical demonstration, with nurses participating, and a theoretical discussion of why and when it should take place, and what the results signify. Adjustment of insulin dosage according to blood glucose levels and types of insulin were also covered.
2. Injection sites for administration of insulin.
3. The storage and handling of insulin. The rationale and procedure for drawing up two types of insulin in one syringe.
4. Oral hypoglycaemic agents.
5. The difference between insulin-dependent-diabetes and non-insulin-dependent-diabetes, and differences in treatment.
6. The importance of dietary treatment in diabetes; a discussion of the food pyramid.
7. The importance of exercise in diabetes treatment.

These points were all discussed in relation to patient education. The setting was relatively informal and the participants were encouraged to ask questions and discuss areas of interest.

APPENDIX 3: LETTER TO DIRECTOR OF NURSING REQUESTING
PERMISSION TO CONDUCT RESEARCH AT STUDY
HOSPITAL

Mrs (name inserted),
Director of Nursing,
..... Hospital,
(address inserted).

Dear Mrs. (name inserted),

I am presently undertaking the Degree of Health Science, Nursing (Honours) at the Western Australian College of Advanced Education, Churchlands Campus. A component of this degree is the completion of a thesis in clinical nursing research.

I am proposing to conduct my research on the nurse's role in diabetic patient education, and believe the results will have implications for the nurse's role in patient education in general, as well as providing valuable information on the needs of nurses atHospital. This will be of use in the future development of in-service staff education programmes.

I would like to request permission to conduct this research at your hospital, and have enclosed a copy of my research proposal. I have had several discussions with both(Nurse Manager, Staff Education), and(Diabetes Educator), and have forwarded copies of the proposal to them.

I look forward to hearing from you,
Yours faithfully,

Jennifer Walters (Ms).

APPENDIX 4: EXPLANATION AND INSTRUCTIONS FOR
QUESTIONNAIRE

THIS QUESTIONNAIRE FORMS PART OF A STUDY BEING CONDUCTED FOR COMPLETION OF THE DEGREE OF HEALTH SCIENCE, NURSING (HONOURS). THE RESEARCH WILL LOOK AT THE ROLE OF REGISTERED NURSES IN DIABETIC PATIENT EDUCATION.

PARTICIPATION IN THIS STUDY IS ENTIRELY VOLUNTARY, HOWEVER, YOUR CO-OPERATION WOULD BE GREATLY APPRECIATED. IF YOU CONSENT TO PARTICIPATE, COULD YOU PLEASE SIGN THE CONSENT FORM BELOW, TEAR OFF AT THE DOTTED LINE AND PLACE YOUR CONSENT SLIP IN THE BOX PROVIDED

ALL RESPONSES ARE CONFIDENTIAL; NO NAMES ARE REQUIRED, AND COMPLETED QUESTIONNAIRES WILL BE SEEN ONLY BY MYSELF AND WILL BE USED ONLY FOR THE PURPOSES OF THIS RESEARCH.

THANK YOU FOR YOUR CO-OPERATION,

JENNIFER WALTERS.

I WOULD LIKE THE FOLLOWING INFORMATION BECAUSE IT MAY AFFECT
YOUR RESPONSES TO SOME OF THE QUESTIONS:

AGE ---

SEX (M/F) ---

YEARS OF POST-REGISTRATION EXPERIENCE ---

POST-BASIC QUALIFICATIONS _____

tear here

I consent to participate in the above-mentioned study, and I
understand that my responses on all questionnaires will be entirely
confidential, and used for the purpose of this study only.

(signature)

APPENDIX 5: EXPLANATION OF THE STUDY AND INSTRUCTIONS TO PARTICIPANTS

To all nursing staff,

I am presently conducting a study at this hospital on diabetic patient education. This study forms part of the assessment for the Bachelor of Health Science, Nursing. The study will consist of a questionnaire to be distributed to all permanently employed registered nurses working in clinical areas of the hospital.

** Participation in this study is entirely voluntary, there is no compulsion for you to participate. You may withdraw from the study at any time.*

Following completion of this questionnaire, half of the Registered Nurses (RNs) will be randomly selected to attend a 45 minute in-service lecture on diabetes which will be conducted by the Diabetes Nurse Educator. This lecture will be repeated on four separate occasions over two weeks, between 1400-1500 hours in the lecture room attached to the cafeteria (dates to be posted).

If your questionnaire is marked "**lecture**" at the top right hand corner of the first page, you will be in the group to attend the lecture. If it is marked "**not attending**", then you will be in the group which will not attend.

** Those who choose to participate, and are in the group to attend the lecture are asked to **please not pass any information on to those not attending**, as this will bias the study.*

Following the final lecture, the questionnaire will again be distributed for all participating RNs to complete, both those in the group which attended the lecture and those in the group which did not.

** All Enrolled Nurses are welcome to attend any of the lectures if they wish.*

** The lecture will be repeated at the end of the study for those who are in the group not to attend, but who would like to.*

** If you agree to participate, I would appreciate it if you could:*

1) return both completed questionnaires as promptly as possible to the boxes provided.

2) attend one of the lectures if you are in the group to attend.

Thank you,
Jennifer Walters.

**APPENDIX 6: LETTER TO DIABETES EXPERTS FOR VALIDATION
OF QUESTIONNAIRE**

Mrs. (name inserted),
Diabetes Nurse Educator,
(address inserted).

Dear Mrs (name inserted),

I am presently undertaking the Degree of Health Science, Nursing (Honours) at the Western Australian College of Advanced Education, Churchlands Campus. A component of this degree is the completion of a thesis in clinical nursing research.

My research project will look at the nurses' role in diabetic patient education. The purpose of the study is to determine whether improving the knowledge base of registered nurses on diabetes will improve their attitudes towards diabetes education, as measured on a diabetes attitude scale. It is postulated that if an increase in knowledge leads to an increase in positive attitudes toward patient education, this will have important implications for the patient, since patient education has been shown to increase compliance with diabetic regimes, resulting in an improved quality of life for the patient.

The study will utilize a questionnaire composed of a diabetes attitude scale which was developed by R.M. Anderson and colleagues (1989) to provide a measure of the attitudes of health professionals toward diabetes education. It is intended to administer the

questionnaire to registered nurses before and after their attendance at an in-service course on diabetes education.

Before the questionnaire can be utilised in this study, however, it is necessary for me to have it validated by experts in the field of diabetes education. It would assist my research greatly if you could spare the time to evaluate the questionnaire on the form provided, using the following criteria:

1. does the item actually measure attitudes towards diabetes education and is it relevant to the study as outlined?
2. is the item relevant to diabetes education in Western Australia specifically?
3. is the item representative of the factor in which it occurs?
4. is there an item/issue not addressed which you feel ought to be, given the purpose of the study?

Could you also please note down your qualifications and experience, particularly with regard to diabetes education. If you have any queries about the scale or the study, I can be contacted on ph. 5278466.

I have enclosed a stamped addressed envelope, and would appreciate it if you could return the scale with your comments by the 20th August, 1989.

Thank you very much for your co-operation,

Yours faithfully,

Jennifer Walters (Ms.)

APPENDIX 7: MARKING GUIDE FOR DIABETES EXPERTS IN
VALIDATION OF QUESTIONNAIRE

ITEM NO.	(1) SPECIFIC RELEVANCE	(2) RELEVANT TO W.A.	(3) FACTOR RELEVANCE
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(4) UNADDRESSED ISSUES

NAME

QUALIFICATIONS

EXPERIENCE IN DIABETES EDUCATION (YEARS)